Fehr & Peers

Memorandum

Subject:	Coombsville Road Traffic Control Assessment Study
From:	Geoff Rubendall
То:	Ahsan Kazmi
Date:	August 31, 2023

SF15-0841

This memorandum presents the methodology, analysis, and findings related to an all way stop control (AWSC) assessment at the following two intersections ("study intersections"):

- Coombsville Road/1st Avenue
- Coombsville Road/4th Avenue

In response to concerns raised by the Coombsville community and members of the Napa County Board of Supervisors, Fehr & Peers was asked to perform an intersection traffic control warrant study to determine if an all-way stop control is warranted at the study intersections. This assessment includes collecting and reviewing traffic volumes and collision history, and site visit to observe sight lines at the side street approaches. This evaluation was performed in accordance with the California *Manual on Uniform Traffic Control Devices* (CA MUTCD), Caltrans *Highway Design Manual* (HDM) and AASHTO *A Policy on Geometric Design of Highways and* Streets (The AASHTO Green Book) standards.

Our memorandum is comprised of the following sections:

- **Executive Summary** Includes our data collection and analysis along with intervention options
- **Methodology** Includes our methodology for the all-way stop control assessment, sight distance assessment, and collision data analysis
- Intersection Evaluations Includes assessment of geometric configuration, traffic data analysis, site visit observations, countermeasures considered, and recommendations for improvements for each location
- **Summary/Next Steps** Includes a summary of potential improvements at each location.

Ahsan Syed Kazmi August 31, 2023 Page 2 of 15

Executive Summary

At both the Coombsville Road/1st Avenue and Coombsville Road/4th Avenue intersections ("study intersections"), traffic data (volume, speed, and vehicle classification) was collected, and collision records were downloaded from the Statewide Integrated Traffic Records System (SWITRS). Our team also conducted a site visit to measure available line of sight and take photos of the vicinity of both study intersections. Our team evaluated the collected data using guidance from the California Manual on Uniform Traffic Control Devices (CAMUTCD) as it relates to supporting the installation of an All Way Stop Control (AWSC).

Based on our review of the data, applicable warrants in CAMUTCD, and best practices related to traffic calming and traffic safety, we have determined the following:

All-Way Stop Control Warrants:

- The **Coombsville Road/1st Avenue intersection** does not meet the criteria to support installation of an AWSC. However, numerous treatments were identified to address documented traffic speeds and intersection safety considerations.
- The traffic data and collision data collected and reviewed for the **Coombsville Road/4**th **Avenue** intersection does not meet the basic criteria to support installation of an AWSC, but the limited visibility between the stop-controlled northbound and uncontrolled westbound approach at Coombsville Rd/4th Avenue does support the installation of an AWSC at this location.
- Additional engineering will be required to design improvements over and above what County forces can install without preparation of construction documents.

Ahsan Syed Kazmi August 31, 2023 Page 3 of 15

Methodology

All Way Stop Control Warrants

The 2014 California Manual on Uniform Traffic Control Revision 7 (CAMUTCD) provides criteria for the evaluation of an all-way stop control (AWSC) evaluation criteria, summarized in **Table 1**. If any of the criteria are met, installation of stop control on all approaches may be warranted. However, meeting a warrant criterion does not automatically justify the installation of traffic control as there may be other factors to consider.

Table 1: All-Way Stop-Control Warrant Criteria

Criteria 1	Criteria 2	Criteria 3
 Major street volumes exceed 300 vehicles per hour for any eight hours of a day, Minor street volumes exceed 200 units¹ per hour for the same eight hours, and Average vehicle delay for the side street exceeds 30 seconds per vehicle in the peak hour 	Insufficient sight distance ²	At least five crashes within the last year that can be corrected by all-way stop-control

Source: *California Manual on Uniform Traffic Control Devices*. Notes:

1. Units include bicycles, pedestrians, and vehicles.

2. Sight distance standards defined by A Policy on Geometric Design of Highways and Streets, AASHTO, 6th Edition.

The CAMUTCD also provides four optional warrants that can be evaluated as part of considering an AWSC. While these alone are not enough to justify installation of AWSC, they can be utilized in conjunction with engineering judgement to address special circumstances or minor shortfalls in satisfying other warrant criteria.

- 1. <u>Left-Turn Conflicts</u>: This optional warrant is intended to address the conflict between leftturning traffic on the major street and oncoming traffic.
- 2. <u>Vehicle/Pedestrian Conflicts:</u> This optional warrant addresses intersections that have conflicts with vehicles and high pedestrian volumes.
- 3. <u>Visibility</u>: This optional warrant addresses intersections where the stopped road user cannot see conflicting traffic and negotiate the intersection unless conflicting traffic is also stopped.
- 4. <u>Neighborhood Collectors:</u> This optional warrant can be applied where two neighborhood collector streets intersect, applying when each has similar operating characteristics, and AWSC would improve traffic operation characteristics.

Ahsan Syed Kazmi August 31, 2023 Page 4 of 15

Data Collection

To apply the above warrants, traffic data is typically collected, including segment traffic volumes and speed data. To collect data to be applied to the above warrants, we recommend collecting traffic counts and speed data over a minimum of one week via hoses on the ground that collect data by time of day for 24 hours a day.

Collision History

To apply warrant criterion 3 above, we review at least five years of crash data. This typically includes accessing the Statewide Integrated Traffic Records System (SWITRS), maintained by California Highway Patrol. While not explicitly required, we typically seek out any other recently published traffic safety studies that may identify other area-wide traffic safety issues or other policies that support proactive improvements to address potential safety issues.

Sight Distance

In many cases, limited line of sight is one potential issue that an AWSC configuration can help address. In these circumstances, we typically review photographic evidence or conduct site visits to review current conditions. Informed by sight distance requirements described in Caltrans Highway Design Manul (HDM), we apply the speed data collected and distances measured it he filed to determine if there is appropriate line of sight provided for vehicles to safely and comfortable see one another and make corrective actions to avoid collisions.

In many instances of AWSC assessments, corner sight distance (SD) is most applicable. CSD represents the line of sight between a motorist's eye on the side street being able to see approaching vehicles in each direction to safely and comfortable enter the roadway.

When reviewing sightlines, it is appropriate to review several roadway features, such as presence of on-street parking, plants, trees, and potential other features that could impede line of sight between road users on the side streets and the major street. Ahsan Syed Kazmi August 31, 2023 Page 5 of 15

Intersection Evaluations

This assessment includes a review of the following two intersections in Napa County:

- Coombsville Road/1st Avenue
- Coombsville Road/4th Avenue

Both intersections were evaluated for AWSC warrants using the methodology and approach described above. To perform this assessment, we collecting traffic data at each location, reviewed documented collisions near each intersection, and visited the site to observe traffic conditions and measure distances as part of a sight distance assessment. The following sections summarize the information gathered, analyzed, and findings as part of this study.

Geometric Configuration

- Coombsville Road is a two-lane east-west collector that provides a connection between downtown City of Napa and the Napa County neighborhoods directly east of downtown. The posted speed limit along this corridor in the vicinity of our study locations is 40 mph.
- 1st Avenue is a two-lane collector street that has residences fronting the roadway, and provides a connection to Hagen Rd to the north. 1st Street tees into Coombsville Road. The intersection of Coombsville Road and 1st Avenue is side street stop controlled.
- 4th Avenue is a two-lane residential street. The intersection of Coombsville Road and 4th Avenue is side street stop controlled.

Traffic Data

We collected a week of volume, speed, and vehicle classification data at each of the study intersections. Generally the mid-week volume data was higher than on the weekends. **Figures 1 and 2** illustrate the average daily traffic during the mid-week period (Tuesday through Thursday), as well as the 85th percentile speeds measured at each hose count location for the Coombsville Road/1st Avenue and Coombsville Road/4th Avenue intersections, respectively. Detailed traffic count data, including the vehicle classifications collect, are included in Appendix A.









Figure 1

Traffic Data Collection Summary Coombsville Rd / 1st Ave









Figure 2

Traffic Data Collection Summary Coombsville Rd / 4th Ave Ahsan Syed Kazmi August 31, 2023 Page 8 of 15

Coombsville Road and 1st Avenue

Along Coombsville Road, in both locations on both sides of 1st Avenue, the 85th percentile speed was calculated to be higher than the posted speed limit. The 85th percentile speed in both directions east and west of the intersection is between 42 and 45 mph, which is within 5 mph of the posted speed limit. While this does not trigger any particular improvement or countermeasure, this does demonstrate that the roadway characteristics and motorist behavior is such that many motorists regularly pass through this area at a rate of speed greater than the posted speed limit.

12 vehicles, or less than 1% of the total volume along Coombsville, were found to be operating at 60 mph or higher during the week of our traffic data collection. We also found that heavy vehicles (trucks and other multi-axle vehicle) accounted for about 9% of the traffic along Coombsville Road during the week of our traffic data collection.

Daily traffic volumes were found to be the highest during the mid-week period (Tuesday Wednesday and Thursday). West of the intersection about 1,900 to 2,000 vehicles were counted in each direction. East of the intersection about 1,600 vehicles were counted in each direction. North of the intersection along 1st Avenue about 1,000 vehicles were counted in each direction.

Coombsville Road and 4th Avenue

The 85th percentile speed calculated east and west of this intersection was found to range from 39 to 42 mph, demonstrating that motorists generally travel at about the posted speed limit. However, based on our field visit, we found that many motorists travel north and south along the 3rd Avenue and 4th Avenue corridor, which requires travelling east and west along Coombsville Road for a short segment west of 4th Avenue. Therefore, the rate of speed for those motorists between 3rd Avenue and 4th Avenue likely comprises a large amount of slower moving vehicles on that segment. Furthermore we would assume that the through traffic on Coombsville Road at this location likely travels slightly above the posted speed limit similar to what was found near the 1st Avenue intersection.

24 vehicles, or just 0.2% of the volume along Coombsville Road were found to be operating at 60 mph or higher during the week of our traffic data collection. We also found that heavy vehicles (trucks and other multi-axle vehicle) accounted for between 11 and 13% of the traffic along Coombsville Road during the week of our traffic data collection.

Daily traffic volumes were found to be the highest during the mid-week period (Tuesday Wednesday and Thursday). West of the intersection about 1,250 to 1,300 vehicles were counted in each direction. East of the intersection about 800 vehicles were counted in each direction. South of the intersection along 4th Avenue about 800 to 900 vehicles were counted in each direction.

Ahsan Syed Kazmi August 31, 2023 Page 9 of 15

Sight Distance

Stopping sight distance (SSD) was reviewed at each location to determine whether vehicles on Coombsville Road have enough time to stop ahead of turning vehicles from 4th Avenue or 1st Avenue. SSD is defined as the distance required by a driver of a vehicle, traveling at a given speed, to bring the vehicle to a stop after an object on the road becomes visible.¹ Design speed, or in the case of our assessment the observed 85th percentile speed, is one of the inputs to determine SSD requirements. According to the *Caltrans Highway Design Manual* (HDM), the SSD for a design speed of 40 mph is 305 feet and the SSD for a design speed of 45 mph is 360 feet.

Coombsville Road and 1st Avenue

At the 1st Avenue approach, a motorist waiting to turn from 1st Avenue to Coombsville Road can see more than 600 ft to the west and over 400 ft to the east. This line of sight (in each direction) is greater than the corresponding SSD for traffic approaching at the maximum observed 85th percentile speed of 45 mph.

Coombsville Road and 4th Avenue

At the 4th Avenue approach, line of sight from the motorists on 4th Avenue and westbound traffic is obstructed by the existing outcropping of bushes and trees at the southeast corner of the intersection. During our field visit, we measured the distance a motorist on the side street can see to the east (looking at oncoming westbound traffic) is about 110 ft. Provided that our data collection effort found that the westbound 85th percentile speed for the westbound approach was 42 mph, a SSD of approximate 340 ft would be necessary to meet applicable sightlines at this intersection. While at the site, we investigated how the line of sight could be improved with removing plantings and trees, and installing a vertical wall along the existing fence line. With that improvement, we estimate that the line of sight could be increased from about 110 ft to 225 ft. Even with that improvement, the line of sight provided would not be adequately long enough for motorists to make decisions to enter the roadway. As such, additional traffic control devices and features should be considered to either reduce westbound traffic speeds or require westbound traffic to slow or stop at this intersection.

¹ Sight distance standards defined by *A Policy on Geometric Design of Highways and Streets*, AASHTO, 6th Edition.

Ahsan Syed Kazmi August 31, 2023 Page 10 of 15

Collision Data

Five years of collision data (2018-2023) was assessed to inform the stop control warrant recommendation. Tables 3 and 4 display the collision history in the vicinity of the Coombsville Road/1st Avenue and Coombsville Road/4th Avenue intersections, respectively.

Year	Collision Type	Motor Vehicle Involved With	PCF Violation Code	Severity
2018	Hit Object	Fixed Object	Improper Turning	PDO
	Hit Object	Fixed Object	Driving Under Influence	2 – Injury (Severe)
2019	Hit Object	Fixed Object	Improper Turning	PDO
	Hit Object	Fixed Object	Driving Under Influence	PDO
2021	Hit Object	Fixed Object	Improper Turning	4 – Injury (Complaint of Pain)
2022	Hit Object	Fixed Object	Improper Turning	2 – Injury (Severe)
2023	Hit Object	N/A	Unsafe Speed	2 – Injury (Severe)

Table 3. Coombsville Road and 1st Avenue Collision History

Table 4. Coombsville Road and 4th Avenue Collision History

Year	Collision Type	Motor Vehicle Involved With	PCF Violation Code	Severity
2018	Rear End	Other Motor Vehicle	Unsafe Speed	PDO
2021	Rear End	Other Motor Vehicle	Driving Under Influence	PDO

Notes:

PDO = Property Damage Only

PCF = Primary Collision Factor

Neither intersection meets the minimum number of collisions for all-way-stop control, which is 3 collisions in a 12 month period susceptible to correction with a stop sign (right angle collisions or minor street failing to yield to major street traffic), or 5 collisions within a 2 year period.

Ahsan Syed Kazmi August 31, 2023 Page 11 of 15

AWSC Warrant Results

Coombsville Road and 1st Avenue

We collected data that showed, per the CAMUTCD, the Coombsville Road/1st Avenue intersection does not meet the warrants for all way stop control. However, based on community feedback and our review of the data collected, we would recommend roadway features that would be expected to reduce traffic speeds in the east and west directions.

Coombsville Road and 4th Avenue

While the data collected does not support the installation of an AWSC at the Coombsville Road/4th Avenue, the sight distance issues described for the westbound approach do meet the optional warrant based on limited sight distance to consider an all-way stop.

As such, we would recommend the County consider installation of an all-way stop control configuration at the Coombsville Road/4th Avenue intersection.

Ahsan Syed Kazmi August 31, 2023 Page 12 of 15

Recommendations

Based on the methodology and analysis presented above, we recommend the following treatments be considered at each location:

Coombsville Road and 1st Avenue

While the warrants for an AWSC are not met, reviewing data collected and discussions with the County about community concerns around this intersection, we recommend the County consider improvements that would increase visibility, provide advanced warning to motorists in the eastbound and westbound directions, and reduce the operating speed of motorists along Coombsville Road. While relatively easy to implement "quick-build" improvements may be feasible, more permanent features that are easier to maintain and less likely to be damaged should be considered. The County also developed recommendations for intersection treatments, referred to as the 1st Avenue Improvement Plan, included as an Appendix. These potential improvements, and additional improvements and recommendations by category, include:

Landscaping Maintenance

• County should proactively trim overgrown trees and plantings on the south side of Coombsville Road on the westbound approach to the 1st Avenue intersection.

Pavement Markings and Surface Treatments

• County should investigate the feasibility and appropriateness of speed limit pavement markings along the corridor, including a post installation data collection effort to determine effectiveness.



Ahsan Syed Kazmi August 31, 2023 Page 13 of 15

- The 1st Avenue Improvement Plan suggests adding yellow pavement markers on both sides of the centerline starting at the curve on the east side of the intersection and ending 100 feet after 1st Avenue.
- Additional reflective surface mounted markers should be considered at the intersection to increase visibility for the centerline and approach lanes. This could include pavement markings, striping, and pavement markers to visually reduce the amount of pavement at the intersection, with the goal to cause motorists to reduce speeds as they turn through the intersection.

Advanced Warning Signs

• Consider advisory speed signs, or corridor level speed limit reductions with necessary infrastructure and policies to enforce.

Intersection Signage and Advanced Conspicuity Enhancements

The county has identified several potential treatments at the intersection including:

- Double-Sided Chevrons: The 1st Avenue Improvement Plan suggests adding solar powered LED double-sided chevrons with yellow reflective posts be installed on the curve on the east side of the intersection near the current intersection sign. These would be expected to increase visibility which would be expected to cause some motorists to travel through the area at a lower rate of speed.
- LED Stop Sign: The 1st Avenue Improvement Plan identified the potential to upgrade the existing stop sign to a solar-powered LED stop sign would improve visibility. However, adding lights may not be as effective as relocating the sign to a location that is less obstructed by the existing utility poles. Furthermore, the collision history did not reflect an issue with side street motorists not yielding to oncoming traffic. Therefore, enhancements to the side street stop control signage would not be expected to have a considerable benefit to the issues observed at this intersection.
- Cross Traffic Does Not Stop Sign: The 1st Avenue Improvement Plan suggests adding additional signage at the intersection to warn vehicles approaching from 1st Avenue, which is appropriate, but for similar reasons stated above, would not be expected to shift driver behavior or address the observed safety issues at this intersection.









Ahsan Syed Kazmi August 31, 2023 Page 14 of 15

Horizontal and Vertical Features

• County should investigate the feasibility and applicability of centerline rumble strips. While collision records did not indicate head-on collisions were an issue, the numerous fixed object crashes do support the need for features that warn motorists that they are deviating from their lane. We do not recommend rumble strips on the right side of the travel lanes due to the potential safety issues to would cause for cyclists.



 County should study the feasibility of raised median islands at the intersection to provide vertical features to deter motorists from crossing over medians and edge lines. Accommodations for cyclists should be considered to ensure vertical islands or medians provide improved comfort and result in potential safety benefits to bicycle facilities through the intersection.



Ahsan Syed Kazmi August 31, 2023 Page 15 of 15

• The County should consider hardened centerline treatments, which could be rounded asphalt or concrete bumps that address motorists' behavior of taking the eastbound left turn from Coombsville Road to northbound 1st Avenue at a high rate of speed.

Additional Resources

In 2020, FHWA released their Roadway Departure Strategic Plan² that provides potential treatments that could be considered for this corridor. We recommend the County consider corridor level studies and policies to determine appropriate treatments to reduce speeds, decrease the potential for crashes. FHWA has also published materials related to Safe Systems approach and speed limit setting that would be applicable to the County as a whole, and likely address the same type of speeding and intermittent lane departure crashes that were documented along Coombsville Road.

Coombsville Road at 4th Avenue

Due to the limited sight lines observed at this intersection, an all-way stop control is recommended to be implemented at the Coombsville Road and 4th Avenue intersection. In addition to the additional STOP signs, the following is suggested to support the change in traffic control and address other corridor safety issues:

- Consider trimming plantings and trees to maximize sightlines for westbound motorists and motorists waiting on 4th Avenue approach.
- Consider decreasing the lane widths from 12 feet to 11 feet with a slightly increased median separation for installation of raised pavement markers
- Consider additional corridor improvements to be consistent with the potential improvements described above at the Coombsville Road/1st Street intersection.

² https://highways.dot.gov/sites/fhwa.dot.gov/files/2022-06/RwD Strategic Plan 2020 508.pdf



Location: 04 - Coombsville Rd, W-O First Ave Date Range: 8/11/2023 - 8/17/2023 Site Code:

Time	٤	Friday 3/11/202	23	8	Saturda /12/202	y 3	8	Sunday 8/13/202	/ 3	8	Monday 3/14/202	/ 3	8	Tuesda 3/15/202	y 23	W 8	ednesd /16/202	ay 3	T 8	'hursda /17/202	iy 3	Mid-V	Veek Av	erage
	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total
12:00 AM	14	10	24	15	11	26	22	9	31	16	11	27	7	12	19	5	2	7	3	6	9	5	7	12
1:00 AM	8	3	11	7	5	12	9	5	14	4	14	18	1	2	3	2	2	4	7	2	9	3	2	5
2:00 AM	4	4	8	4	0	4	5	4	9	4	6	10	1	3	4	0	2	2	3	2	5	1	2	4
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5:00 AM	17	19	36	7	5	12	10	5	15	15	20	35	19	23	42	14	19	33	19	26	45	17	23	40
6:00 AM	53	54	107	30	21	51	13	20	33	58	54	112	61	50	111	57	49	106	55	49	104	58	49	107
7:00 AM	87	90	177	48	58	106	27	43	70	83	88	171	103	97	200	116	128	244	121	107	228	113	111	224
8:00 AM	118	146	264	85	110	195	69	71	140	116	134	250	100	129	229	222	163	385	193	166	359	172	153	324
9:00 AM	130	126	256	91	123	214	57	120	177	96	114	210	95	144	239	101	125	226	110	121	231	102	130	232
10:00 AM	115	151	266	98	142	240	72	97	169	111	143	254	126	126	252	112	136	248	120	122	242	119	128	247
11:00 AM	135	148	283	143	149	292	132	117	249	124	147	271	137	144	281	111	141	252	124	150	274	124	145	269
12:00 PM	159	163	322	130	108	238	94	116	210	121	129	250	116	137	253	141	144	285	132	170	302	130	150	280
1:00 PM	150	132	282	118	121	239	111	90	201	138	109	247	130	147	277	190	195	385	177	163	340	166	168	334
2:00 PM	152	138	290	116	89	205	103	105	208	118	137	255	101	143	244	139	167	306	113	140	253	118	150	268
3:00 PM	150	180	330	111	117	228	91	98	189	133	178	311	128	178	306	141	158	299	130	161	291	133	166	299
4:00 PM	143	156	299	97	95	192	87	117	204	140	110	250	151	159	310	130	138	268	165	143	308	149	147	295
5:00 PM	140	162	302	80	112	192	103	115	218	110	157	267	156	134	290	162	148	310	156	147	303	158	143	301
6:00 PM	114	122	236	90	99	189	102	90	192	109	99	208	108	109	217	115	94	209	105	99	204	109	101	210
7:00 PM	88	105	193	84	86	170	92	87	179	93	88	181	83	69	152	83	83	166	91	75	166	86	76	161
8:00 PM	80	79	159	72	66	138	63	58	121	83	66	149	68	53	121	64	69	133	71	72	143	68	65	132
9:00 PM	82	41	123	53	47	100	69	36	105	60	30	90	41	27	68	55	47	102	37	33	70	44	36	80
10:00 PM	63	40	103	45	39	84	47	24	71	25	19	44	25	17	42	29	13	42	23	14	37	26	15	40
11:00 PM	28	14	42	24	35	59	18	12	30	15	19	34	12	6	18	7	5	12	15	10	25	11	7	18
Total	2,042	2,093	4,135	1,553	1,646	3,199	1,403	1,446	2,849	1,778	1,878	3,656	1,775	1,918	3,693	2,001	2,038	4,039	1,978	1,989	3,967	1,918	1,982	3,900
Percent	49%	51%		49%	51%	11.00	49%	51%	44.00	49%	51%		48%	52%		50%	50%		50%	50%		49%	51%	
AM Peak	11:00	10:00	11:00	11:00	11:00	11:00	11:00	09:00	11:00	11:00	11:00	11:00	11:00	09:00	11:00	08:00	08:00	08:00	08:00	08:00	08:00	08:00	08:00	08:00
PM Peak	12.00	15:00	15:00	12.00	13.00	13.00	13:00	16.00	17.00	124	15:00	15:00	17.00	15:00	16:00	13.00	13.00	13.00	13:00	12.00	13.00	13.00	13.00	13:00
Vol.	159	180	330	130	121	239	111	117	218	140	178	311	156	178	310	190	195	385	177	170	340	166	168	334



Location: 05 - Coombsville Rd, E-O First Ave Date Range: 8/11/2023 - 8/17/2023 Site Code:

Time	٤	Friday 8/11/202	3	S 8	Saturda <u>)</u> /12/202	y 3	8	Sunday /13/202	, 3	8	Monday 3/14/202	, 3	- 8	Tuesda 3/15/202	y 23	W 8	ednesd /16/202	ay 3	T 8	⁻ hursda 3/17/202	у 3	Mid-V	Veek Av	rerage
	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total
12:00 AM	10	6	16	9	10	19	16	8	24	15	12	27	7	12	19	2	2	4	3	6	9	4	7	11
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7:00 AM	67	79	146	44	46	90	24	30	54	74	78	152	102	87	189	91	104	195	87	94	181	93	95	188
8:00 AM	81	122	203	62	89	151	48	56	104	91	108	199	71	116	187	148	116	264	122	113	235	114	115	229
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11:00 AM	110	129	239	107	114	221	111	103	214	116	132	248	123	129	252	93	128	221	91	129	220	102	129	231
12:00 PM	135	142	277	109	102	211	78	98	176	97	106	203	103	119	222	123	121	244	105	121	226	110	120	231
1:00 PM	116	115	231	104	96	200	84	80	164	122	99	221	123	123	246	125	147	272	138	110	248	129	127	255
2:00 PM	142	110	252	91	74	165	75	83	158	99	112	211	98	121	219	128	122	250	97	111	208	108	118	226
3:00 PM	145	156	301	89	83	172	66	76	142	119	147	266	114	146	260	115	132	247	124	131	255	118	136	254
4:00 PM	116	136	252	74	89	163	65	85	150	112	85	197	130	121	251	119	110	229	122	112	234	124	114	238
5:00 PM	107	123	230	72	77	149	79	83	162	87	137	224	131	113	244	131	117	248	118	128	246	127	119	246
6:00 PM	96	86	182	78	86	164	50	67	117	98	74	172	77	84	161	92	71	163	85	81	166	85	79	163
7:00 PM	73	89	162	70	66	136	63	60	123	75	72	147	57	58	115	80	66	146	73	61	134	70	62	132
8:00 PM	67	55	122	60	58	118	47	46	93	66	58	124	57	49	106	47	63	110	58	61	119	54	58	112
9:00 PM	65	34	99	44	38	82	58	28	86	47	28	75	33	20	53	43	47	90	32	30	62	36	32	68
10:00 PM	49	34	83	32	37	69	28	21	49	25	20	45	18	12	30	23	10	33	18	17	35	20	13	33
11:00 PM	20	15	35	19	33	52	14	7	21	16	18	34	11	3	14	5	4	9	13	8	21	10	5	15
Total	1,697	1,760	3,457	1,265	1,332	2,597	1,066	1,152	2,218	1,500	1,589	3,089	1,530	1,625	3,155	1,630	1,656	3,286	1,566	1,592	3,158	1,575	1,624	3,200
Percent	49%	51%		49%	51%	11.00	48%	52%	11.00	49%	51%		48%	52%		50%	50%		50%	50%		49%	51%	
AM Peak	09:00	10:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00	09:00	11:00	08:00	11:00	08:00	08:00	11:00	08:00	08:00	11:00	11:00
PM Peak	114	15.00	15.00	12.00	12.00	12:00	13.00	12.00	12:00	13.00	15:00	15.00	123	15:00	15:00	148	120	13.00	122	129	235	13.00	129	13:00
Vol.	145	156	301	109	102	211	84	98	176	122	147	266	131	146	260	131	147	272	138	131	255	129	136	255



Location: 06 - First Ave, N/O Coombsville Rd Date Range: 8/11/2023 - 8/17/2023 Site Code:

Time	8	Friday 8/11/202	3	S 8	aturday /12/202	y 3	8	Sunday 8/13/202	, 3	8	Monday /14/202	/ :3	- 8	Tuesda <u>)</u> 8/15/202	y :3	W 8	ednesd /16/202	ay 3	T 8	'hursda /17/202	у 3	Mid-V	Veek Av	erage
	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total
12:00 AM	5	5	10	9	4	13	9	4	13	4	2	6	4	4	8	3	0	3	3	3	6	3	2	6
1:00 AM	2	1	3	2	2	4	1	2	3	3	5	8	1	2	3	1	0	1	1	1	2	1	1	2
2:00 AM	1	1	2	3	1	4	2	3	5	3	2	5	1	2	3	0	2	2	0	1	1	0	2	2
3:00 AM	2	2	4	2	3	5	1	1	2	1	0	1	1	1	2	2	2	4	2	2	4	2	2	3
4:00 AM	5	4	9	4	1	5	4	3	7	3	3	6	4	2	6	3	6	9	5	7	12	4	5	9
5:00 AM	9	4	13	3	2	5	1	4	5	8	7	15	13	13	26	8	7	15	13	10	23	11	10	21
6:00 AM	29	27	56	12	5	17	6	8	14	28	29	57	25	26	51	23	26	49	19	20	39	22	24	46
7:00 AM	53	45	98	21	29	50	10	23	33	44	46	90	44	57	101	94	92	186	88	67	155	75	72	147
8:00 AM	68	65	133	37	38	75	39	37	76	58	61	119	68	51	119	123	109	232	120	96	216	104	85	189
9:00 AM	52	48	100	50	61	111	34	47	81	45	39	84	53	72	125	62	57	119	58	63	121	58	64	122
10:00 AM	60	73	133	36	58	94	34	33	67	42	56	98	46	55	101	55	66	121	49	54	103	50	58	108
11:00 AM	70	72	142	65	79	144	53	47	100	58	69	127	67	69	136	61	57	118	52	49	101	60	58	118
12:00 PM	74	75	149	66	48	114	41	49	90	52	57	109	50	65	115	68	73	141	64	79	143	61	72	133
1:00 PM	64	58	122	48	57	105	61	39	100	55	50	105	54	70	124	109	107	216	88	93	181	84	90	174
2:00 PM	77	88	165	49	43	92	45	44	89	54	70	124	64	74	138	70	102	172	66	75	141	67	84	150
3:00 PM	77	102	179	56	72	128	49	47	96	77	89	166	74	89	163	76	87	163	75	93	168	75	90	165
4:00 PM	73	78	151	58	44	102	44	54	98	70	70	140	80	92	172	74	93	167	95	80	175	83	88	171
5:00 PM	83	88	171	33	60	93	66	70	136	76	77	153	75	78	153	87	85	172	78	73	151	80	79	159
6:00 PM	44	58	102	34	35	69	74	44	118	39	58	97	55	54	109	51	55	106	50	53	103	52	54	106
7:00 PM	43	41	84	30	36	66	50	42	92	40	40	80	45	32	77	40	49	89	35	33	68	40	38	78
8:00 PM	25	34	59	24	21	45	29	25	54	37	27	64	32	20	52	30	21	51	38	33	71	33	25	58
9:00 PM	28	18	46	25	24	49	27	22	49	25	15	40	17	16	33	21	14	35	16	13	29	18	14	32
10:00 PM	24	16	40	25	13	38	22	8	30	5	6	11	13	11	24	7	5	12	11	3	14	10	6	17
11:00 PM	13	5	18	9	10	19	7	8	15	7	8	15	5	6	11	3	2	5	4	4	8	4	4	8
Total	981	1,008	1,989	701	746	1,447	709	664	1,373	834	886	1,720	891	961	1,852	1,071	1,117	2,188	1,030	1,005	2,035	997	1,028	2,025
Percent	49%	51%	11.00	48%	52%	11.00	52%	48%	11.00	48%	52%	44.00	48%	52%	44.00	49%	51%	00.00	51%	49%	00.00	49%	51%	
AM Peak	11:00 70	10:00 73	11:00 142	11:00 65	11:00 79	11:00 144	11:00 53	09:00 47	11:00	08:00 58	11:00 69	11:00 127	08:00 68	09:00 72	11:00	08:00 123	08:00 109	08:00 232	08:00	00:80 96	08:00 216	08:00	08:00 85	08:00 189
PM Peak	17:00	15:00	15:00	12:00	15:00	15:00	18:00	17:00	17:00	15:00	15:00	15:00	16:00	16:00	16:00	13:00	13:00	13:00	16:00	13:00	13:00	13:00	13:00	13:00
Vol.	83	102	179	66	72	128	74	70	136	77	89	166	80	92	172	109	107	216	95	93	181	84	90	174



Location: 04 - Coombsville Rd, W-O First Ave

Direction: Eastbound / Westbound

Date Range: 8/11/2023 to 8/17/2023

Direction								Speed	d Range	(mph)								Total
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +	Volume
Easthound	4	56	83	320	1,552	2,804	3,172	3,217	1,090	180	40	12	0	0	0	0	0	12 530
Lastbound	0.0%	0.4%	0.7%	2.6%	12.4%	22.4%	25.3%	25.7%	8.7%	1.4%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	12,550
Westbound	8	70	132	844	2,591	1,364	2,865	3,696	1,216	192	23	7	0	0	0	0	0	12 009
Westbound	0.1%	0.5%	1.0%	6.5%	19.9%	10.5%	22.0%	28.4%	9.3%	1.5%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	13,000
Total	12	126	215	1,164	4,143	4,168	6,037	6,913	2,306	372	63	19	0	0	0	0	0	25 529
TOLAI	0.0%	0.5%	0.8%	4.6%	16.2%	16.3%	23.6%	27.1%	9.0%	1.5%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	25,538

Total Study Percentile Speed	d Summ	nary	Total Study Spee	d Statistics	
Eastbound			Eastbou	nd	
50th Percentile (Median)	37.6	mph	Mean (Average) Speed	37.0	mph
85th Percentile	43.7	mph	10 mph Pace	33.6 - 43.6	mph
95th Percentile	47.1	mph	Percent in Pace	52.0	%
Westbound			Westbou	nd	
50th Percentile (Median)	38.4	mph	Mean (Average) Speed	36.3	mph
85th Percentile	44.1	mph	10 mph Pace	36.4 - 46.4	mph
95th Percentile	47.2	mph	Percent in Pace	50.9	%



Location: 05 - Coombsville Rd, E-O First Ave

Direction: Eastbound / Westbound

Date Range: 8/11/2023 to 8/17/2023

Direction								Speed	d Range	(mph)								Total Volume
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +	Volume
Eastbound	3	13	23	146	855	2,045	3,750	2,645	657	94	17	6	0	0	0	0	0	10 254
Lastbound	0.0%	0.1%	0.2%	1.4%	8.3%	19.9%	36.6%	25.8%	6.4%	0.9%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	10,234
Westbound	18	65	83	133	622	2,337	4,295	2,522	535	88	8	0	0	0	0	0	0	10 706
Westbound	0.2%	0.6%	0.8%	1.2%	5.8%	21.8%	40.1%	23.6%	5.0%	0.8%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10,700
Total	21	78	106	279	1,477	4,382	8,045	5,167	1,192	182	25	6	0	0	0	0	0	20.060
Total	0.1%	0.4%	0.5%	1.3%	7.0%	20.9%	38.4%	24.7%	5.7%	0.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	20,900

Total Study Percentile Spee	d Summ	ary	Total Study Spee	d Statistics	
Eastbound			Eastbou	nd	
50th Percentile (Median)	37.9	mph	Mean (Average) Speed	37.5	mph
85th Percentile	42.9	mph	10 mph Pace	33.4 - 43.4	mph
95th Percentile	46.2	mph	Percent in Pace	65.0	%
Westbound			Westbou	nd	
50th Percentile (Median)	37.5	mph	Mean (Average) Speed	37.1	mph
85th Percentile	42.4	mph	10 mph Pace	32.9 - 42.9	mph
95th Percentile	45.4	mph	Percent in Pace	68.9	%



Location: 06 - First Ave, N/O Coombsville Rd

Direction: Northbound / Southbound

Date Range: 8/11/2023 to 8/17/2023

Direction								Speer	d Range	(mph)								Total Volume
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +	Volume
Northbound	12	52	188	928	2,747	1,874	356	47	12	1	0	0	0	0	0	0	0	6 217
Northbound	0.2%	0.8%	3.0%	14.9%	44.2%	30.1%	5.7%	0.8%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0,217
Southbound	7	65	183	945	2,955	1,994	224	14	0	0	0	0	0	0	0	0	0	6 387
Southbound	0.1%	1.0%	2.9%	14.8%	46.3%	31.2%	3.5%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0,307
Total	19	117	371	1,873	5,702	3,868	580	61	12	1	0	0	0	0	0	0	0	12 604
TOtal	0.2%	0.9%	2.9%	14.9%	45.2%	30.7%	4.6%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	12,004

Total Study Percentile Speed	d Summ	ary	Total Study Spee	d Statistics	
Northbound			Northbou	ınd	
50th Percentile (Median)	28.6	mph	Mean (Average) Speed	28.5	mph
85th Percentile	32.9	mph	10 mph Pace	23.8 - 33.8	mph
95th Percentile	35.6	mph	Percent in Pace	76.0	%
Southbound			Southbou	Ind	
50th Percentile (Median)	28.5	mph	Mean (Average) Speed	28.2	mph
85th Percentile	32.3	mph	10 mph Pace	23.8 - 33.8	mph
95th Percentile	34.5	mph	Percent in Pace	80.3	%



- Location: 04 Coombsville Rd, W-O First Ave
- Count Direction: Eastbound / Westbound

Date Range: 8/11/2023 to 8/17/2023

Direction						FHWA Ve	ehicle Clas	sification						Total Volume
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
Easthound	169	8,457	2,755	61	988	88	0	4	8	0	0	0	0	12 520
Eastbound	1.3%	67.5%	22.0%	0.5%	7.9%	0.7%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	12,550
Westbound	235	8,883	2,829	50	900	98	0	2	9	1	0	0	1	12 009
westbound	1.8%	68.3%	21.7%	0.4%	6.9%	0.8%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	13,000
Total	404	17,340	5,584	111	1,888	186	0	6	17	1	0	0	1	25 529
Total	1.6%	67.9%	21.9%	0.4%	7.4%	0.7%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	20,000

FHWA Vehicle Classification	
Class 1 - Motorcycles	Class 8 - Four or Fewer Axle Single-Trailer Trucks
Class 2 - Passenger Cars	Class 9 - Five-Axle Single-Trailer Trucks
Class 3 - Other Two-Axle, Four-Tire Single Unit Vehicles	Class 10 - Six or More Axle Single-Trailer Trucks
Class 4 - Buses	Class 11 - Five or fewer Axle Multi-Trailer Trucks
Class 5 - Two-Axle, Six-Tire, Single-Unit Trucks	Class 12 - Six-Axle Multi-Trailer Trucks
Class 6 - Three-Axle Single-Unit Trucks	Class 13 - Seven or More Axle Multi-Trailer Trucks
Class 7 - Four or More Axle Single-Unit Trucks	



Location: 05 - Coombsville Rd, E-O First Ave

Count Direction: Eastbound / Westbound

Date Range: 8/11/2023 to 8/17/2023

Direction						FHWA Ve	hicle Clas	sification						Total Volume
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
Factbound	91	6,591	2,518	56	955	30	0	3	9	1	0	0	0	10.254
Eastbound	0.9%	64.3%	24.6%	0.5%	9.3%	0.3%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	10,234
Westbound	201	7,077	2,415	51	909	38	0	3	9	3	0	0	0	10 706
westbound	1.9%	66.1%	22.6%	0.5%	8.5%	0.4%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	10,700
Total	292	13,668	4,933	107	1,864	68	0	6	18	4	0	0	0	20.060
Total	1.4%	65.2%	23.5%	0.5%	8.9%	0.3%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	20,960

FHWA Vehicle Classification	
Class 1 - Motorcycles	Class 8 - Four or Fewer Axle Single-Trailer Trucks
Class 2 - Passenger Cars	Class 9 - Five-Axle Single-Trailer Trucks
Class 3 - Other Two-Axle, Four-Tire Single Unit Vehicles	Class 10 - Six or More Axle Single-Trailer Trucks
Class 4 - Buses	Class 11 - Five or fewer Axle Multi-Trailer Trucks
Class 5 - Two-Axle, Six-Tire, Single-Unit Trucks	Class 12 - Six-Axle Multi-Trailer Trucks
Class 6 - Three-Axle Single-Unit Trucks	Class 13 - Seven or More Axle Multi-Trailer Trucks
Class 7 - Four or More Axle Single-Unit Trucks	

Location: 06 - First Ave, N/O Coombsville Rd

Count Direction: Northbound / Southbound

Date Range: 8/11/2023 to 8/17/2023

Direction						FHWA Ve	hicle Clas	sification						Total Volume
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
Northbound	95	3,773	1,722	31	519	66	0	2	7	2	0	0	0	6 217
Northbound	1.5%	60.7%	27.7%	0.5%	8.3%	1.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0,217
Southbound	106	4,019	1,563	47	578	69	0	3	1	1	0	0	0	6 2 9 7
Southbound	1.7%	62.9%	24.5%	0.7%	9.0%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0,307
Total	201	7,792	3,285	78	1,097	135	0	5	8	3	0	0	0	12 604
Total	1.6%	61.8%	26.1%	0.6%	8.7%	1.1%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	12,004

FHWA Vehicle Classification	
Class 1 - Motorcycles	Class 8 - Four or Fewer Axle Single-Trailer Trucks
Class 2 - Passenger Cars	Class 9 - Five-Axle Single-Trailer Trucks
Class 3 - Other Two-Axle, Four-Tire Single Unit Vehicles	Class 10 - Six or More Axle Single-Trailer Trucks
Class 4 - Buses	Class 11 - Five or fewer Axle Multi-Trailer Trucks
Class 5 - Two-Axle, Six-Tire, Single-Unit Trucks	Class 12 - Six-Axle Multi-Trailer Trucks
Class 6 - Three-Axle Single-Unit Trucks	Class 13 - Seven or More Axle Multi-Trailer Trucks
Class 7 - Four or More Axle Single-Unit Trucks	



Location: Coombsville Rd, W/O 4th Ave Date Range: 8/5/2023 - 8/11/2023 Site Code:

Time	5	Saturda; 8/5/2023	y 3		Sunday 8/6/2023	3		Monday 8/7/2023	/ 3	-	Tuesday 8/8/2023	y 3	W	/ednesd 8/9/2023	ay 3	T 8	'hursda 3/10/202	y 3	8	Friday 8/11/202	3	Mid-V	Veek Av	erage
	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total
12:00 AM	6	4	10	8	16	24	5	7	12	2	4	6	1	0	1	3	6	9	7	5	12	2	3	5
1:00 AM	5	7	12	5	5	10	4	5	9	1	2	3	3	4	7	4	2	6	3	1	4	3	3	5
2:00 AM	2	2	4	2	2	4	0	0	0	5	2	7	4	0	4	2	2	4	4	2	6	4	1	5
3:00 AM	3	2	5	3	1	4	1	3	4	1	2	3	4	4	8	3	0	3	4	2	6	3	2	5
4:00 AM	6	5	11	2	1	3	4	4	8	5	5	10	6	9	15	9	6	15	6	4	10	7	7	13
5:00 AM	10	17	27	6	6	12	14	22	36	14	30	44	21	24	45	12	32	44	7	26	33	16	29	44
6:00 AM	15	14	29	12	12	24	29	45	74	33	36	69	33	52	85	30	32	62	35	45	80	32	40	72
7:00 AM	32	36	68	22	28	50	78	68	146	69	68	137	79	79	158	68	72	140	60	72	132	72	73	145
8:00 AM	67	68	135	43	51	94	91	104	195	101	103	204	86	90	176	80	90	170	85	99	184	89	94	183
9:00 AM	85	78	163	56	66	122	80	97	177	77	113	190	83	88	171	93	86	179	93	81	174	84	96	180
10:00 AM	84	93	177	58	64	122	98	64	162	84	75	159	84	85	169	80	83	163	105	96	201	83	81	164
11:00 AM	95	110	205	60	72	132	71	107	178	90	79	169	64	79	143	79	110	189	82	102	184	78	89	167
12:00 PM	75	86	161	66	64	130	103	102	205	93	88	181	86	97	183	94	89	183	96	101	197	91	91	182
1:00 PM	88	91	179	67	74	141	83	86	169	85	94	179	74	80	154	82	74	156	84	91	175	80	83	163
2:00 PM	62	91	153	58	51	109	97	85	182	101	86	187	90	105	195	82	77	159	76	86	162	91	89	180
3:00 PM	65	61	126	50	40	90	98	107	205	125	107	232	116	97	213	120	108	228	126	99	225	120	104	224
4:00 PM	65	53	118	53	48	101	90	94	184	81	78	159	90	102	192	103	104	207	98	95	193	91	95	186
5:00 PM	57	70	127	46	65	111	78	85	163	119	94	213	95	80	175	81	91	172	54	95	149	98	88	187
6:00 PM	53	53	106	54	40	94	59	48	107	77	79	156	55	64	119	65	65	130	62	66	128	66	69	135
7:00 PM	36	41	77	48	53	101	47	58	105	50	74	124	56	42	98	44	46	90	37	55	92	50	54	104
8:00 PM	53	43	96	55	48	103	44	43	87	46	55	101	56	49	105	35	49	84	51	48	99	46	51	97
9:00 PM	27	28	55	27	31	58	22	16	38	29	26	55	26	29	55	41	15	56	40	21	61	32	23	55
10:00 PM	25	22	47	18	16	34	16	13	29	16	12	28	15	11	26	24	19	43	33	28	61	18	14	32
11:00 PM	12	17	29	14	13	27	7	6	13	5	8	13	4	7	11	7	5	12	9	20	29	5	7	12
Total	1,028	1,092	2,120	833	867	1,700	1,219	1,269	2,488	1,309	1,320	2,629	1,231	1,277	2,508	1,241	1,263	2,504	1,257	1,340	2,597	1,260	1,287	2,547
Percent AM Back	48%	52%	44.00	49%	51%	44.00	49%	51%	00.00	50%	50%	00.00	49%	51%	00.00	50%	50%	44.00	48%	52%	40.00	49%	51%	00.00
Vol.	95	110	205	60	72	132	98	107	195	101	113	204	86	90	176	93	110	189	10:00	102	201	89	96	183
PM Peak	13:00	13:00	13:00	13:00	13:00	13:00	12:00	15:00	12:00	15:00	15:00	15:00	15:00	14:00	15:00	15:00	15:00	15:00	15:00	12:00	15:00	15:00	15:00	15:00
Vol.	88	91	179	67	74	141	103	107	205	125	107	232	116	105	213	120	108	228	126	101	225	120	104	224



Location: Coombsville Rd, E/O 4th Ave Date Range: 8/5/2023 - 8/11/2023 Site Code:

Time	Ş	Saturda <u>)</u> 8/5/2023	y 3	:	Sunday 8/6/2023	3	1	Monday 8/7/2023	/ 3	-	Tuesday 8/8/2023	y 3	w	/ednesd 8/9/2023	ay 3	T 8	'hursda 3/10/202	y 3	8	Friday 8/11/202	3	Mid-V	Veek Av	erage
	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total
12:00 AM	2	3	5	11	8	19	6	2	8	1	1	2	0	0	0	1	5	6	7	4	11	1	2	3
1:00 AM	4	4	8	4	3	7	3	7	10	0	0	0	2	1	3	4	2	6	2	1	3	2	1	3
2:00 AM	2	1	3	1	1	2	1	0	1	3	2	5	3	0	3	0	1	1	3	2	5	2	1	3
3:00 AM	2	1	3	2	2	4	1	3	4	1	1	2	4	3	7	1	0	1	2	3	5	2	1	3
4:00 AM	3	5	8	1	1	2	2	2	4	1	2	3	3	5	8	4	4	8	1	3	4	3	4	6
5:00 AM	10	2	12	8	4	12	13	11	24	7	9	16	14	10	24	6	12	18	7	10	17	9	10	19
6:00 AM	6	7	13	5	10	15	26	18	44	28	16	44	23	24	47	31	13	44	31	17	48	27	18	45
7:00 AM	11	21	32	8	19	27	46	42	88	48	41	89	43	41	84	50	39	89	49	40	89	47	40	87
8:00 AM	47	38	85	14	31	45	57	63	120	67	68	135	52	51	103	42	52	94	37	53	90	54	57	111
9:00 AM	52	59	111	24	50	74	61	58	119	49	78	127	49	59	108	51	63	114	52	53	105	50	67	116
10:00 AM	45	54	99	37	35	72	60	52	112	58	56	114	57	60	117	43	62	105	65	77	142	53	59	112
11:00 AM	62	68	130	29	29	58	52	70	122	62	57	119	49	55	104	57	58	115	41	67	108	56	57	113
12:00 PM	49	44	93	41	35	76	79	68	147	59	65	124	63	59	122	53	58	111	65	60	125	58	61	119
1:00 PM	55	56	111	46	47	93	53	60	113	53	59	112	48	56	104	46	46	92	63	53	116	49	54	103
2:00 PM	43	60	103	42	26	68	48	55	103	46	50	96	45	62	107	52	48	100	51	45	96	48	53	101
3:00 PM	47	34	81	32	23	55	49	75	124	60	71	131	50	64	114	49	76	125	57	64	121	53	70	123
4:00 PM	39	39	78	36	25	61	66	55	121	50	59	109	58	59	117	68	60	128	46	63	109	59	59	118
5:00 PM	35	30	65	32	31	63	42	61	103	88	57	145	54	43	97	45	50	95	34	56	90	62	50	112
6:00 PM	31	33	64	38	29	67	32	22	54	61	43	104	41	45	86	46	46	92	43	33	76	49	45	94
7:00 PM	31	26	57	29	37	66	35	25	60	34	42	76	35	22	57	34	24	58	30	29	59	34	29	64
8:00 PM	33	28	61	32	33	65	27	22	49	27	35	62	52	35	87	20	29	49	42	24	66	33	33	66
9:00 PM	21	16	37	19	19	38	19	12	31	21	21	42	24	20	44	28	7	35	31	15	46	24	16	40
10:00 PM	24	12	36	13	8	21	11	7	18	12	6	18	10	6	16	15	12	27	20	19	39	12	8	20
11:00 PM	12	10	22	15	8	23	2	3	5	2	3	5	6	2	8	7	2	9	14	11	25	5	2	7
Total	666	651	1,317	519	514	1,033	791	793	1,584	838	842	1,680	785	782	1,567	753	769	1,522	793	802	1,595	792	798	1,590
Percent	51%	49%	44.00	50%	50%	00.00	50%	50%	44.00	50%	50%	00.00	50%	50%	40.00	49%	51%	44.00	50%	50%	40.00	50%	50%	00:00
Vol.	62	68	130	37	50 50	09:00 74	61	70	122	67	78	135	57	60	10:00	57	63	115	65	77	142	56	67	116
PM Peak	13:00	14:00	13:00	13:00	13:00	13:00	12:00	15:00	12:00	17:00	15:00	17:00	12:00	15:00	12:00	16:00	15:00	16:00	12:00	15:00	12:00	17:00	15:00	15:00
Vol.	55	60	111	46	47	93	79	75	147	88	71	145	63	64	122	68	76	128	65	64	125	62	70	123



Location: 4th Ave, S/O Coombsville Rd Date Range: 8/5/2023 - 8/11/2023 Site Code:

Time	Ş	Saturda <u>)</u> 8/5/2023	y 3		Sunday 8/6/2023	3		Monday 8/7/2023	7		Tuesda <u>:</u> 8/8/2023	y 3	w	/ednesd 8/9/2023	ay 3	T 8	'hursda 3/10/202	у 3	ε	Friday 8/11/202	3	Mid-V	Veek Av	erage
	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total
12:00 AM	1	4	5	14	2	16	6	1	7	3	1	4	0	1	1	2	3	5	6	3	9	2	2	3
1:00 AM	4	1	5	2	1	3	1	4	5	2	1	3	3	1	4	0	0	0	0	1	1	2	1	2
2:00 AM	3	2	5	1	1	2	1	0	1	1	2	3	1	2	3	1	2	3	2	3	5	1	2	3
3:00 AM	2	2	4	0	2	2	2	2	4	2	1	3	3	2	5	1	3	4	1	4	5	2	2	4
4:00 AM	3	7	10	0	1	1	6	6	12	5	8	13	6	5	11	6	8	14	4	8	12	6	7	13
5:00 AM	19	4	23	8	3	11	23	14	37	28	12	40	22	13	35	32	12	44	26	9	35	27	12	40
6:00 AM	12	15	27	9	13	22	46	24	70	44	29	73	48	32	80	47	25	72	48	22	70	46	29	75
7:00 AM	22	26	48	13	18	31	43	49	92	64	54	118	59	60	119	64	50	114	70	46	116	62	55	117
8:00 AM	51	38	89	33	41	74	65	63	128	67	62	129	67	60	127	63	59	122	74	60	134	66	60	126
9:00 AM	44	51	95	36	39	75	70	46	116	68	40	108	52	59	111	52	69	121	50	69	119	57	56	113
10:00 AM	59	59	118	52	34	86	40	52	92	36	53	89	55	59	114	55	63	118	59	62	121	49	58	107
11:00 AM	77	61	138	53	47	100	59	39	98	50	53	103	56	38	94	73	42	115	63	61	124	60	44	104
12:00 PM	57	41	98	53	42	95	66	57	123	52	58	110	63	57	120	57	50	107	75	57	132	57	55	112
1:00 PM	54	42	96	51	43	94	52	55	107	60	55	115	52	49	101	54	51	105	69	52	121	55	52	107
2:00 PM	58	46	104	45	32	77	58	77	135	53	69	122	68	63	131	61	60	121	70	61	131	61	64	125
3:00 PM	50	37	87	33	27	60	62	90	152	66	83	149	56	84	140	66	95	161	69	98	167	63	87	150
4:00 PM	37	46	83	41	34	75	69	49	118	57	60	117	74	51	125	68	59	127	55	76	131	66	57	123
5:00 PM	55	34	89	47	26	73	50	52	102	72	62	134	57	53	110	65	56	121	55	35	90	65	57	122
6:00 PM	30	31	61	32	34	66	45	42	87	57	43	100	46	41	87	43	40	83	45	28	73	49	41	90
7:00 PM	34	23	57	23	23	46	49	31	80	48	33	81	31	28	59	41	26	67	33	27	60	40	29	69
8:00 PM	22	28	50	34	29	63	31	25	56	28	28	56	32	20	52	33	24	57	32	15	47	31	24	55
9:00 PM	18	15	33	21	16	37	10	11	21	10	12	22	18	9	27	15	22	37	19	18	37	14	14	29
10:00 PM	13	4	17	10	5	15	9	5	14	8	5	13	9	8	17	10	12	22	17	22	39	9	8	17
11:00 PM	14	7	21	9	2	11	3	5	8	7	5	12	8	1	9	5	2	7	17	3	20	7	3	9
Total	739	624	1,363	620	515	1,135	866	799	1,665	888	829	1,717	886	796	1,682	914	833	1,747	959	840	1,799	896	819	1,715
Percent	54%	46%		55%	45%		52%	48%		52%	48%		53%	47%		52%	48%		53%	47%		52%	48%	
AM Peak	11:00	11:00	11:00	11:00	11:00	11:00	09:00	08:00	08:00	09:00	08:00	08:00	08:00	07:00	08:00	11:00	09:00	08:00	08:00	09:00	08:00	08:00	08:00	08:00
PM Peak	14.00	14.00	138	53 12:00	47	12.00	16:00	15:00	128	17:00	15:00	129	16:00	15:00	127	16:00	15:00	122	12.00	15:00	15:00	16:00	15:00	120
Vol.	58	46	104	53	43	95	69	90	152	72	83	149	74	84	140	68	95	161	75	98	167	66	87	150



- Location: Coombsville Rd, W/O 4th Ave
- Direction: Eastbound / Westbound
- Date Range: 8/5/2023 to 8/11/2023

Direction								Spee	d Range	(mph)							
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +
Eastbound	22	36	163	1,099	2,388	2,171	1,371	623	177	49	10	5	1	2	1	0	0
Lastbound	0.3%	0.4%	2.0%	13.5%	29.4%	26.7%	16.9%	7.7%	2.2%	0.6%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
Westbound	2	18	129	1,143	2,666	1,502	1,387	1,008	417	109	32	9	5	1	0	0	0
westbound	0.0%	0.2%	1.5%	13.6%	31.6%	17.8%	16.5%	12.0%	4.9%	1.3%	0.4%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%
Total	24	54	292	2,242	5,054	3,673	2,758	1,631	594	158	42	14	6	3	1	0	0
Total	0.1%	0.3%	1.8%	13.6%	30.5%	22.2%	16.7%	9.9%	3.6%	1.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%

Total Study Percentile Speed	d Summ	ary	Total Study Spee	d Statistics	
Eastbound			Eastbou	nd	
50th Percentile (Median)	30.6	mph	Mean (Average) Speed	31.3	mph
85th Percentile	38.5	mph	10 mph Pace	24.6 - 34.6	mph
95th Percentile	42.8	mph	Percent in Pace	56.1	%
Westbound			Westbou	Ind	
50th Percentile (Median)	30.6	mph	Mean (Average) Speed	32.5	mph
85th Percentile	41.3	mph	10 mph Pace	23.2 - 33.2	mph
95th Percentile	46.2	mph	Percent in Pace	51.8	%



- Location: Coombsville Rd, E/O 4th Ave
- Direction: Eastbound / Westbound
- Date Range: 8/5/2023 to 8/11/2023

Direction								Spee	d Range	(mph)							
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +
Eastbound	18	465	903	121	373	925	1,200	766	259	81	21	7	3	1	2	0	0
Lastbound	0.3%	9.0%	17.6%	2.4%	7.2%	18.0%	23.3%	14.9%	5.0%	1.6%	0.4%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%
Westbound	16	149	658	467	400	994	1,278	808	268	71	29	7	5	2	0	0	1
westbound	0.3%	2.9%	12.8%	9.1%	7.8%	19.3%	24.8%	15.7%	5.2%	1.4%	0.6%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%
Total	34	614	1,561	588	773	1,919	2,478	1,574	527	152	50	14	8	3	2	0	1
Total	0.3%	6.0%	15.2%	5.7%	7.5%	18.6%	24.1%	15.3%	5.1%	1.5%	0.5%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%

Total Study Percentile Speed	d Summ	Total Study Speed Statistics							
Eastbound		Eastbound							
50th Percentile (Median)	34.0	mph	Mean (Average) Speed	31.3	mph				
85th Percentile	41.9	mph	10 mph Pace	32.3 - 42.3	mph				
95th Percentile	46.5	mph	Percent in Pace	42.6	%				
Westbound			Westbou	Ind					
50th Percentile (Median)	34.6	mph	Mean (Average) Speed	32.8	mph				
85th Percentile	42.2	mph	10 mph Pace	32.0 - 42.0	mph				
95th Percentile	46.8	mph	Percent in Pace	45.9	%				



- Location: 4th Ave, S/O Coombsville Rd
- Direction: Northbound / Southbound
- Date Range: 8/5/2023 to 8/11/2023

Direction								Spee	d Range	(mph)							
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +
Northbound	319	2,598	2,841	113	1	0	0	0	0	0	0	0	0	0	0	0	0
Northbound	5.4%	44.2%	48.4%	1.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Southbound	103	1,574	3,227	320	12	0	0	0	0	0	0	0	0	0	0	0	0
Southbound	2.0%	30.1%	61.6%	6.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total	422	4,172	6,068	433	13	0	0	0	0	0	0	0	0	0	0	0	0
Total	3.8%	37.6%	54.6%	3.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Total Study Percentile Speed	d Summ	Total Study Speed Statistics							
Northbound		Northbound							
50th Percentile (Median)	15.0	mph	Mean (Average) Speed	14.8	mph				
85th Percentile	17.4	mph	10 mph Pace	10.0 - 20.0	mph				
95th Percentile	18.9	mph	Percent in Pace	92.6	%				
Southbound			Southbou	Ind					
50th Percentile (Median)	16.1	mph	Mean (Average) Speed	16.1	mph				
85th Percentile	18.7	mph	10 mph Pace	11.3 - 21.3	mph				
95th Percentile	20.4	mph	Percent in Pace	93.7	%				



- Location: Coombsville Rd, W/O 4th Ave
- Count Direction: Eastbound / Westbound

Date Range: 8/5/2023 to 8/11/2023

Direction						FHWA Ve	hicle Clas	sification						Total Volume
	1	2	3	4	5	6	7	8	9	10	11	12	13	Voranio
Easthound	120	5,411	1,727	34	630	183	0	2	10	0	0	0	1	9 1 1 9
Eastbound	1.5%	66.7%	21.3%	0.4%	7.8%	2.3%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0,110
Westhound	144	5,464	2,001	49	716	42	0	7	4	1	0	0	0	0 1 2 0
westbound	1.7%	64.8%	23.7%	0.6%	8.5%	0.5%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0,420
Total	264	10,875	3,728	83	1,346	225	0	9	14	1	0	0	1	16 546
Total	1.6%	65.7%	22.5%	0.5%	8.1%	1.4%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	10,540

FHWA Vehicle Classification	
Class 1 - Motorcycles	Class 8 - Four or Fewer Axle Single-Trailer Trucks
Class 2 - Passenger Cars	Class 9 - Five-Axle Single-Trailer Trucks
Class 3 - Other Two-Axle, Four-Tire Single Unit Vehicles	Class 10 - Six or More Axle Single-Trailer Trucks
Class 4 - Buses	Class 11 - Five or fewer Axle Multi-Trailer Trucks
Class 5 - Two-Axle, Six-Tire, Single-Unit Trucks	Class 12 - Six-Axle Multi-Trailer Trucks
Class 6 - Three-Axle Single-Unit Trucks	Class 13 - Seven or More Axle Multi-Trailer Trucks
Class 7 - Four or More Axle Single-Unit Trucks	



- Location: Coombsville Rd, E/O 4th Ave
- Count Direction: Eastbound / Westbound

Date Range: 8/5/2023 to 8/11/2023

Direction						FHWA Ve	ehicle Clas	sification						Total Volume
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
Easthound	93	3,213	1,259	39	477	58	0	3	3	0	0	0	0	5 1 4 5
Eastbound	1.8%	62.4%	24.5%	0.8%	9.3%	1.1%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	5,145
Westhound	83	3,210	1,176	58	584	34	0	5	3	0	0	0	0	5 1 5 2
westbound	1.6%	62.3%	22.8%	1.1%	11.3%	0.7%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	5,155
Total	176	6,423	2,435	97	1,061	92	0	8	6	0	0	0	0	10 209
rotar	1.7%	62.4%	23.6%	0.9%	10.3%	0.9%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	10,290

FHWA Vehicle Classification								
Class 1 - Motorcycles	Class 8 - Four or Fewer Axle Single-Trailer Trucks							
Class 2 - Passenger Cars	Class 9 - Five-Axle Single-Trailer Trucks							
Class 3 - Other Two-Axle, Four-Tire Single Unit Vehicles	Class 10 - Six or More Axle Single-Trailer Trucks							
Class 4 - Buses	Class 11 - Five or fewer Axle Multi-Trailer Trucks							
Class 5 - Two-Axle, Six-Tire, Single-Unit Trucks	Class 12 - Six-Axle Multi-Trailer Trucks							
Class 6 - Three-Axle Single-Unit Trucks	Class 13 - Seven or More Axle Multi-Trailer Trucks							
Class 7 - Four or More Axle Single-Unit Trucks								



- Location: 4th Ave, S/O Coombsville Rd
- Count Direction: Northbound / Southbound

Date Range: 8/5/2023 to 8/11/2023

Direction						FHWA Ve	ehicle Clas	sification						Total Volume
	1	2	3	4	5	6	7	8	9	10	11	12	13	Volume
Northbound	176	3,920	1,288	26	446	16	0	0	0	0	0	0	0	5 972
Northbound	3.0%	66.8%	21.9%	0.4%	7.6%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3,072
Southbound	144	3,342	1,368	19	319	42	0	0	2	0	0	0	0	5 226
Soumbound	2.8%	63.8%	26.1%	0.4%	6.1%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5,230
Total	320	7,262	2,656	45	765	58	0	0	2	0	0	0	0	11 109
rotai	2.9%	65.4%	23.9%	0.4%	6.9%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11,100

FHWA Vehicle Classification								
Class 1 - Motorcycles	Class 8 - Four or Fewer Axle Single-Trailer Trucks							
Class 2 - Passenger Cars	Class 9 - Five-Axle Single-Trailer Trucks							
Class 3 - Other Two-Axle, Four-Tire Single Unit Vehicles	Class 10 - Six or More Axle Single-Trailer Trucks							
Class 4 - Buses	Class 11 - Five or fewer Axle Multi-Trailer Trucks							
Class 5 - Two-Axle, Six-Tire, Single-Unit Trucks	Class 12 - Six-Axle Multi-Trailer Trucks							
Class 6 - Three-Axle Single-Unit Trucks	Class 13 - Seven or More Axle Multi-Trailer Trucks							
Class 7 - Four or More Axle Single-Unit Trucks								